

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Application No. 10/597,974) Confirmation No. 8764
Filed: June 12, 2007)
Applicants: Jean-Claude Amelia et al.)
Title: TARGET DEVICE FOR)
PRODUCING A RADIOISOTOPE)
Art Unit: 2881)
Examiner: Michael J. Logie)
Attorney Docket: 8279/88901)
Customer No.: 22242)

Declaration of AMELIA J-C

I, AMELIA J-C hereby declare as follows:

1. I am one of the named inventors of the present application, United States Patent Application 10/597,974 for a "Target Device For Producing A Radioisotope."
2. The claims of the present application recite an irradiation cell that has a removable insert comprising two insert parts, each of the insert parts being made of different materials. This two-part insert design allows for inserts with longer cavities and improved heat exchange, while allowing the insert to be as chemically inert as possible.
3. A person having ordinary skill in the art of manufacturing target devices for producing radioisotopes would have known at the time of filing of the above captioned application that niobium is a relatively inert material well suited for a target chamber, but also would have understood that niobium is difficult to machine and therefore a difficult material to use for making an insert of complex design, such as the insert described in BE '263. A built up edge may occur on the

tools used to machine the niobium, leading to high tool wear and/or breakage, and the use of electrical discharge machining is not effective. Therefore, one of ordinary skill in the art would not have believed at the time of the filing of the above captioned application that the complex insert of BE '263 could be reasonably manufactured of niobium.

4. Even if an insert as in BE '263 were manufactured out of niobium, the insert would not have many of the advantages described in my patent application. For instance, an insert such as described in BE '263 made purely of niobium could not have a target cavity with a length of 50 mm or greater. However, manufacturing the insert as a two-part insert made up of two different metals, as described in the present application, allows for the length of the target cavity to be 50 mm or greater in length, allowing the efficiency of irradiating a target material to be improved.
5. The spherical target chamber described in the technical note by Zeisler et al. cited in the Office Action dated January 18, 2011 is of a substantially different design than the target chamber of the insert described in BE '263. The target chamber of Zeisler lacks an elongate cavity, and is not machined from niobium. Instead, the target chamber of Zeisler is assembled from two niobium hemispheres that are welded together. One of ordinary skill at the time of the filing of the above captioned application would not have combined structural aspects of Zeisler and the complex insert of BE '263. At most, one of ordinary skill reading Zeisler would have believed that niobium has beneficial material properties, and that it would be beneficial to manufacture a target chamber solely from niobium. However, niobium, tantalum, and other similar materials are difficult to machine, and one of ordinary skill would not have believed that niobium or tantalum was an appropriate material for manufacturing the complex target chamber insert of BE '263.
6. U.S. Patent 6,586,747 to Erdman describes a holder body 56 and rear window 64 that are integrally formed of niobium or another inert material as an alternative to a holder body formed of silver or other metals that include impurities. Erdman does not describe a two-part insert made of two different materials.
7. Erdman '747 includes two shallow cavities machined into the front and rear of the holder body. One of ordinary skill in the art at the time of the filing of the above captioned application would not have

understood Erdman to have suggested that it was possible to construct a more complex structure, such as the insert of BE '263 that includes an elongate cavity and a cooling channel concentrically disposed about the elongate cavity, out of niobium.

8. The structure of the Erdman target cavity is substantially different than that of BE 1011263. Erdman shows a shallow target cavity, and increasing the length of the target cavity is described as undesirable, as it increases the volume of the target cavity and may therefore become economically undesirable by requiring more initial liquid target material. Therefore, one of ordinary skill in the art at the time of the filing of the above captioned application would not have applied the disclosure of Erdman to modify irradiation cell designs with longer target cavities, such as Be 1011263. Furthermore, Erdman would not have suggested to one of ordinary skill in the art at the time of the present invention that target chambers with deep target cavities, such as 50mm or greater, could be manufactured in part or in whole from niobium. The ability to provide a deep target cavity (such as 50 mm or greater) machined from niobium in an insert of the type shown in BE '263 was surprising and unexpected.

I hereby declare that all statements made herein are believed to be true; and further that these statements were made with the knowledge that willful false statements are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity or enforceability of the application or any patent issued thereon.

11-05-2011

Date

ABW